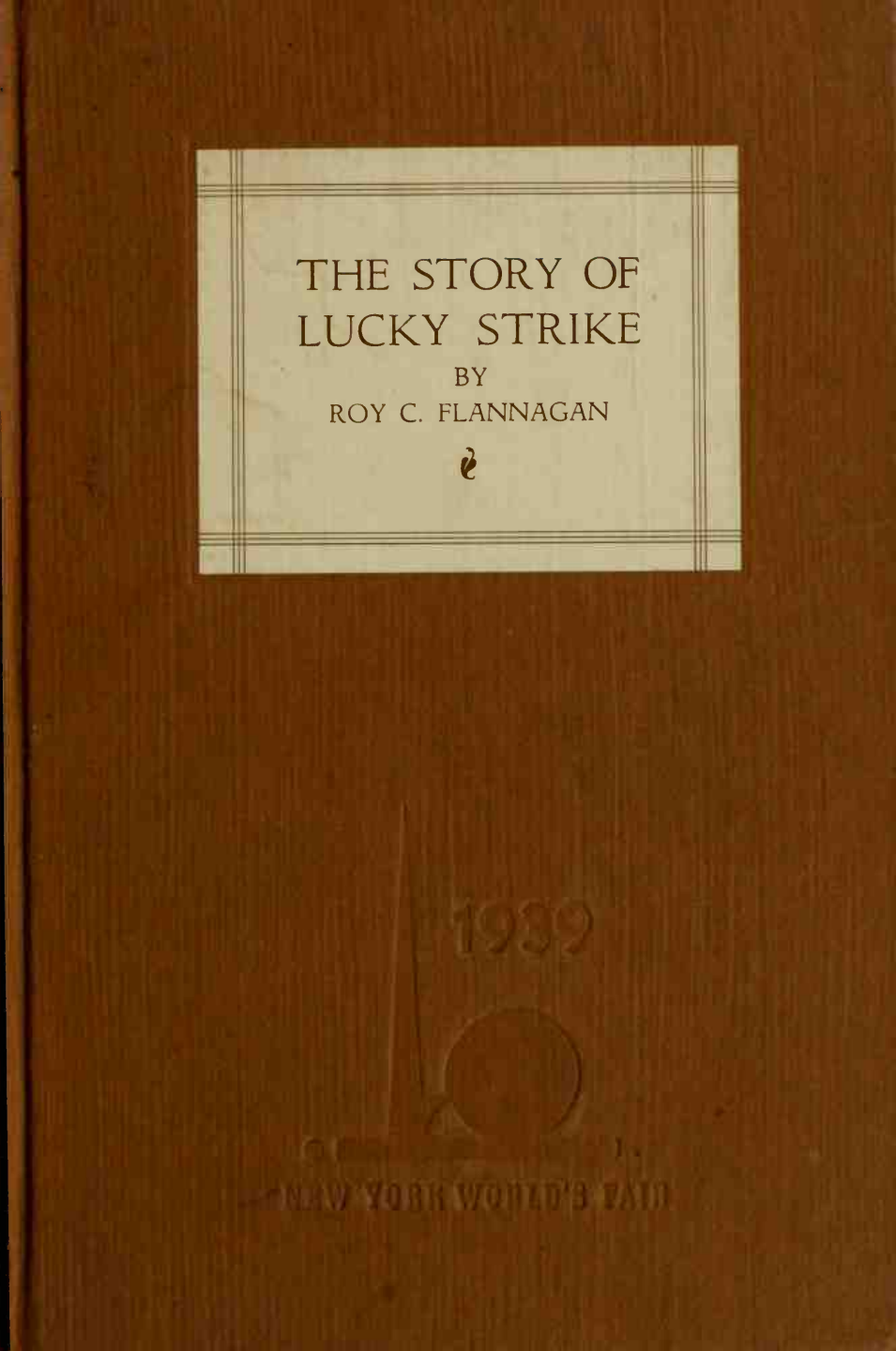
THE STORY OF LUCKY STRIKE

BY

ROY C. FLANNAGAN



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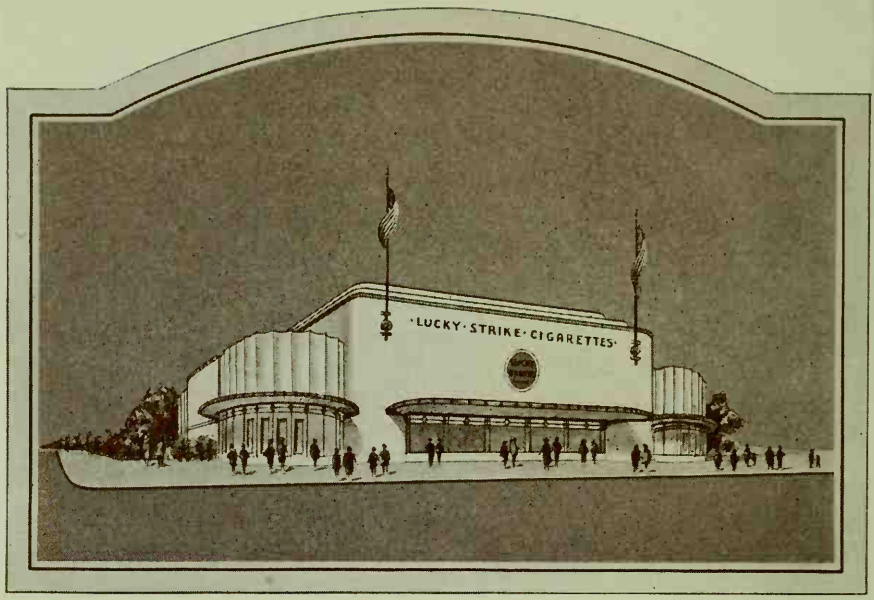
New York World's Fair Edition



At the New York World's Fair.

Visitors will see the processes that this book describes. Machines will actually roll and pack Lucky Strikes. Dioramas will show how tobacco is grown and how it is sold at the tobacco auctions. A motion picture will show step by step how the tobacco is handled. In short, the exhibit brings the tobacco districts and the factory to the World's Fair.

THE STORY OF LUCKY STRIKE

By

ROY C. FLANNAGAN

Author, and Staff Commentator of the Richmond News Leader, Richmond, Virginia

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FOREWORD

In October 1937 I wrote a series of articles on the tobacco industry for my paper, The Richmond (Va.) News Leader, which subsequently were reprinted in pamphlet form for the Virginia State Chamber of Commerce.

I sketched the whole chain of production from farm to factory. A shipment of tobacco which I followed on this interesting trail led me to one of the Lucky Strike plants.

When the newspaper series was published, The American Tobacco Company suggested that I expand my sketches into a book. They were interested in what an average observer thinks about one of the most fascinating modern industries.

Accordingly, I proceeded on the basis of my notes and considerable additional research, to answer in greater detail some of the questions about tobacco that most often occur to a smoker.

Why did tobacco become the economic foundation of the first permanent English settlement in America and save the struggling Jamestown colony from starvation and failure?

Who invented the cigarette and how did this

form of tobacco become so tremendously popular?

Why and how are more than 100 different types of leaf used in every single cigarette?

What really happens at a tobacco sale and what does an auctioneer actually say in that chant of his?

Why is tobacco considered the most temperamental material in modern industry?

In the fields the farmers helped me understand many mysteries. In the warehouses I talked to auctioneers and buyers. At the factories I examined precision instruments that have enabled the manufacturers to obtain better results than the most skilled individual tobacconists. In the laboratories I witnessed the experiments which constantly are improving the product and watched a "smoking machine" by which even the smoke of a cigarette can be tested.

While many facts about cigarette-making are well-known, there are millions who love tobacco yet never have had the privilege of seeing it produced and processed. It is to these that I address this story of one of the most remarkable industries of America.

ROY C. FLANNAGAN

Richmond, Virginia.
June, 1938

I

THE INDIAN PLANT

THE English gentlemen-adventurers who colonized America in 1607 came in search of gold. They found tobacco. The tender leaf which the world now smokes became the basis for the imperiled settlements' prosperity. Tobacco soon yielded riches greater than all the mines of Spain.

From Jamestown, John Rolfe sent the first shipment of Virginia leaf in 1613, seven years before the Pilgrims touched at Plymouth Rock to northward. Within one generation, the gentle product was known the world around.

Rolfe was the husband of the famous Indian Princess, Pocahontas. This daughter of Powhatan, red emperor of Virginia, saved the colony from disaster several times. It is likely that Rolfe learned tobacco cultivation from the Indian girl.

The couple lived at Varina near the place where Richmond, birthplace of the modern cigarette, later was established. Their unusually happy marriage brought peace between the settlers and the Indians, so agriculture thrived and

soon production of the native plant became the chief pursuit of all the English in America.

Before Rolfe's experiments showed Virginians how to raise the plant, the nobility of Britain and the Continent obtained supplies from the Spanish colonies in the tropics. The Spaniards named it after the "taboca," a pipe used by the Carib tribes. Sir Walter Raleigh and his suite made it popular in England and Jean Nicot, French ambassador to Portugal, brought it to the Medici court at Paris, where scholars termed it "Nicotiana Tabacum." The mild, less fibrous Virginia leaf soon became the favorite of smokers everywhere. Trade out of Jamestown grew with great rapidity. Production increased from 20,000 pounds in 1619 to 500,000 in 1627. By 1639, exports totaled 1,500,000 pounds.

So important became the staple that tobacco soon supplanted gold as legal tender in Virginia. It was accepted as payment for all commodities, for taxes, fines and other dues of the colony. A cavalier who would not go to church was fined 200 pounds of tobacco for his delinquency. Bondservants bought their freedom with tobacco. Every store and tavern had its warehouse for the fragrant currency.

The Rolfes grew wealthy. Pocahontas became one of the most charming matrons of the colony. Tragedy, however, soon interrupted this idyll. During a visit to England in 1617, the princess died. Rolfe returned, but in 1622, he was murdered by some of his savage kinsmen at his border farm. His son Thomas succeeded to his estates, and founded a family many members of which still produce tobacco.

As the leaf was "as good as gold," every inhabitant of Virginia sought to raise an annual crop. Rich land was plentiful; labor cheap. In fact, so many citizens abandoned trades to enter agriculture that members of the Assembly became alarmed. The pay of carpenters was thirty pounds of leaf a day and board, but nevertheless they threw away their saws and hammers and took up the hoe. Seamen deserted their ships to try their hand at it. Physicians preferred to treat the soil instead of feverish patients. Throughout the colonies of the south, there developed a passionate enthusiasm for tobacco that continues to this day.

All of the domestic types from which modern cigarettes are made have evolved from two varieties developed during the early days. "Ori-

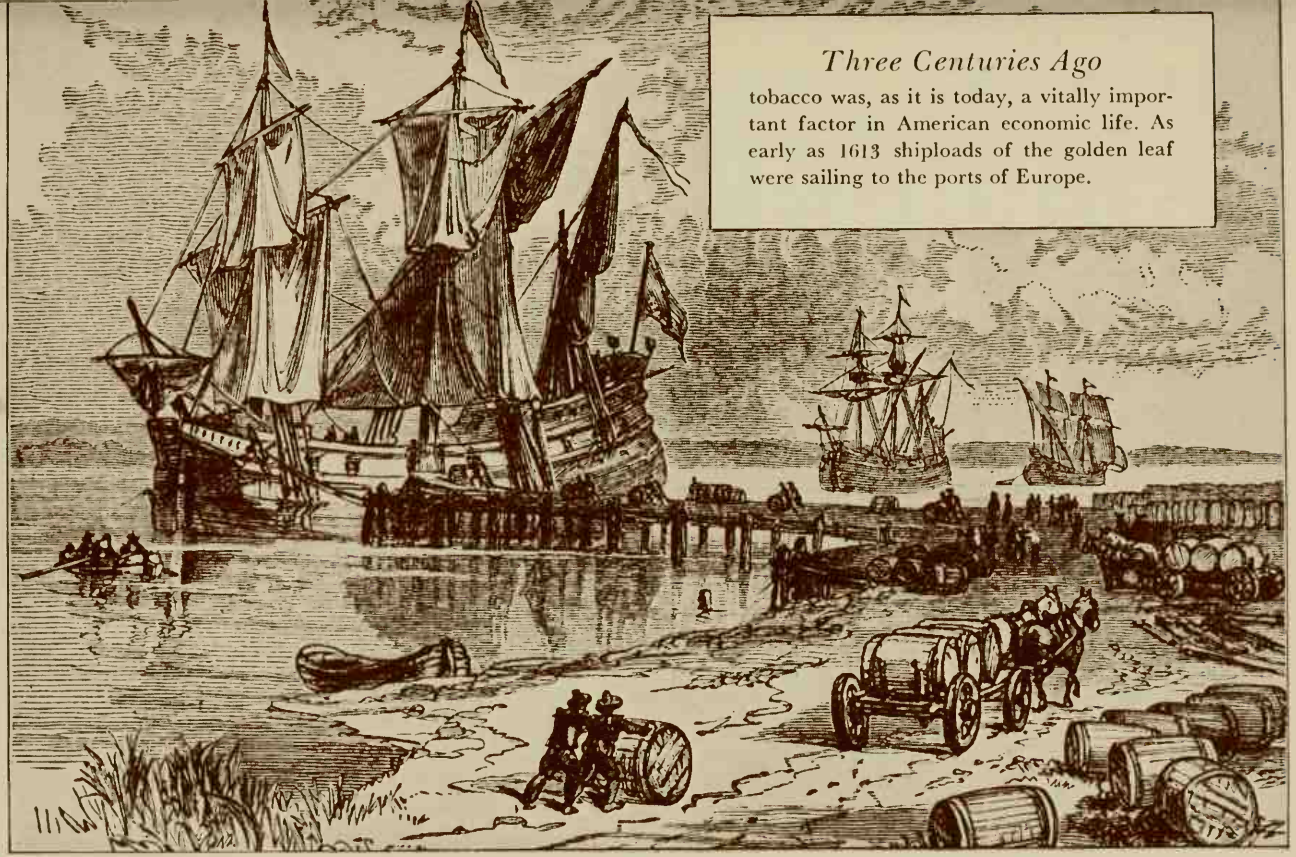
noco" and "Sweet Scented" were the first. Later soil, climate and curing methods yielded others.

One of the important types now used in the blend of Lucky Strike is "Bright." By the English it is still known as "Virginia." This orange-colored leaf with its distinctive flavor and its high natural sugar content is produced in North Carolina, South Carolina, Georgia and northern Florida, as well as in Virginia. Since it is prepared for market by the distinctive flue-curing process, it also is known as "flue-cured."

A second important type used in the blend is "Burley," the fragrant brown leaf raised mainly in Kentucky, Tennessee, and in states bordering on the Ohio River. Burley is sometimes called "air-cured," since it differs from Bright tobacco in this respect.

Other tobaccos used in Luckies are "Maryland," a rich, fine-burning, dark-brown product from north of the Potomac, and "Turkish," a highly aromatic small-leafed variety, many types of which are imported from the Near East.

Incidentally, this Turkish, the only non-domestic tobacco used in Lucky Strikes, has an interesting historical background. The cigarette in its first primitive form was invented by the



Three Centuries Ago

tobacco was, as it is today, a vitally important factor in American economic life. As early as 1613 shiploads of the golden leaf were sailing to the ports of Europe.

Turks. During the Crimean War when England and France were allies of Turkey, the European officers learned to like the Oriental paper-wrapped "cigars." They brought the materials back with them to Paris and to London, and before 1870, a new smoking vogue was well established. American tobacconists, always alert, quickly accepted the innovation, and by 1872, cigarettes similar to those we have today were being manufactured in Richmond. The Oriental tobacco soon was supplanted to a large degree by the lighter, smoother American leaf, but to this day, cigarette smokers desire some Turkish in their blend.

The development of the modern cigarette in the seventies gave the tobacco business a mighty forward impulse. For the first time, the finest tobacco became available to poor as well as rich. Tobacco of the better grades began to sell at prices farmers had not enjoyed since 1619. Again the staple became one of the richest Southern crops, and today, with the growing demand for cigarettes, its economic importance is greater than ever.

II

"MAKING" TOBACCO

The culture of the remarkable plant which sustains one of the greatest industries in the world begins with a seed so tiny that a tablespoonful is enough to plant six and a half acres —an area larger than the average tobacco planter's plot! In the size and shape of the seed can be seen in a glance tobacco's kinship to a number of well-known flowers and vegetables with entirely different properties and uses. The petunia, Irish potato, garden pepper, tomato, and eggplant, all are cousins of this typically American plant.

Let's see how a typical "Old Belt" farmer in Virginia or North Carolina makes his crop. Before the first of April, he is ready to begin the first of a long series of processes which make tobacco such an absorbing problem.

First comes the seed bed. The farmer clears with axe and hoe a space in his second or third growth woodland about as large as the floor of a barn. Here he builds a fire which he spreads carefully over the little area. The burning kills

weed seeds and insect eggs and helps fertilize the loamy bed. He rakes and sweeps now until the bed is as smooth as a table.

Thereafter he mixes soil in with his seed so he can scatter them, and carefully sows his little woodland patch. But this is not all. It is too early in the spring for the seedlings to thrive unprotected, so he covers the bed with a great sheet of cheesecloth and pegs it down tightly. Flyers passing over the tobacco country in March and April see thousands of white squares in the woods below. Some farmers have several of these beds lest accident or plant pests destroy all their tender stock of tobacco.

Meanwhile, he has prepared and fertilized his land for the reception of the crop. By the time danger of frost is past, most of the plants are several inches high and ready for transplanting. Carefully he removes the seedlings, a basketful at a time, and takes them to the field.

Here, along the widely spaced rows that he has measured, he "sets" his plants. With a sharpened stick, he punches a little hole in the ground just large enough to receive the roots, and with a single rhythmic movement, he seals the earth and steps on to the next position. An ordinary

urban gardener marvels at the speed with which he does it, wonders how any of the plants survive such hurried treatment. Rarely, however, are the seedlings wasted. For a few hours, they lie wilted and discouraged, then up come their heads and they begin to grow again.

And how they grow!

By midsummer they are great lush stalks. Cultivated somewhat like corn and cotton, they develop with astonishing rapidity, yielding dividends for every ounce of fertilizer, every hour of care, standing up against the hottest weather. In August, the plants are kept free of grass only by hand-labor with a hoe. There is no room for a mule. There is barely room to walk between the three-foot rows.

At this stage, the tobacco must be "topped" so that each plant will produce leaves of the proper body. This treatment prevents the plants from going to seed—concentrates the energy in the leaves.

Topping must be done with care because to cut a plant too low means tobacco of poor quality. A heavy, fibrous leaf is as bad as a poorly nourished one. In August, the farmers also pull the "suckers"—large sprouts sent out by Mother

As the Plants Ripen

they are "topped". Removing the tops of the stalks enables the remaining portion to receive more complete nourishment, adding to the quality of each leaf.

A Few Prize Plants

remain untopped, and these flower, providing seed carefully gathered by the farmer for next year's planting.

Nature in an effort to repair the surgery of "topping."

With the stalks waist-high, the most anxious moments of the season are approaching. Fearfully the farmer watches the summer sky lest a hail storm flatten his crop. He reads his almanac, wondering if by the law of averages he will suffer a wet summer. Long rainy spells in August will harm the quality of his leaf more than a drought. Even light showers sometimes damage the plant. Droplets of water form tiny lenses through which the sun burns spots upon the precious leaves.

Yet as the tobacco begins to ripen, a Virginia field offers a soul-satisfying sight. No other crop seems to draw so much rich, graceful beauty from the soil. Every leaf in the sturdy plants seems like a page from the book of health. Most crops fade somewhat from the sun of late summer, or are cut up by many insects, but tobacco, watched so carefully, tended so constantly, stands almost unscathed, firm and lovely in the heat. Here and there are carefully selected plants which, untopped, are six feet tall and in flower. These are to supply the seed for next year's crop.

Standing in his tobacco field, the farmer is a

very happy man, yet his suspense is not over. The all important work of curing the leaf still lies ahead of him.

III

"CURING" TOBACCO

To cure tobacco means to dry it for the market. Throughout the years this process, always performed near the fields where the leaf is grown, has developed along with methods of cultivation. The ultimate quality of every crop depends largely upon the care with which it is cured.

The earliest method employed in Virginia was to hang the cut plants along the rafters of the kitchen or in the smoke house. Tobacco of the dark-fired type still is prepared by this method in special barns wherein direct, smoky heat is applied. Another way is to suspend the leaves in well ventilated sheds exposed to the air. Burley and Maryland, two types in the Lucky Strike blend, are air-cured. Still another is to hang the tobacco in the sun. Turkish is dried in this fashion.

Bright tobacco, however, the type of leaf whose cultivation we have described, is prepared for the market by that complicated process known as flue-curing.

Specially constructed log barns eighteen to

twenty-five feet square by twenty-five feet tall are built near the fields. On one side is a lean-to shed and in the side of the structure beneath this shed are two brick or stone "kilns," or fireplaces which extend into the barn. To these kilns, inside, are attached long sheet-iron flues which pass through the barn and carry heat to every cranny of it when the fires are lighted. The flues serve as radiators just as do the long pipes on stoves in rural homes. No smoke can enter the barn, but virtually all of the heat from the kiln fires can be imprisoned within the tight building. Beneath the eaves are small windows called ventilators, and there is a square door.

For days before the first tobacco is ripe for harvest, the farmer has worked part time at his barn. He has sealed up the chinks between the logs, checked the joints of his flues, overhauled the shingle roof, and repaired his kilns. Beside each of his barns he has stacked wigwam fashion a great pile of hardwood and pine poles for use as firewood. At the door are his tobacco sticks—riven pine rods as thick as his thumb and about five feet long.

He is ready now to "prime" his tobacco—to pull the first ripening leaves from each stalk in

Leaf by Leaf

the harvesting is done. As the leaves reach the point of perfect maturity they are "pulled" by hand and made ready for curing. They are tied in bundles and carried to the curing barn for the first step in the long march to the cigarette-making machines.

his fields. At one time whole stalks were cut, but this method no longer is popular. Producers have learned that to strip leaf by leaf as the foliage reaches the proper stage means a better quality product. The plant grows as the harvest continues from day to day, so that nearly every leaf is permitted to reach full maturity before it is hauled away to the barn for curing.

Even on the finest plants, however, there are leaves of varying degrees of quality. Though the plants have been "topped" earlier in the season, leaves now near the top, farthest from the nourishment of the soil, are thinly flavored and somewhat anemic. Those near the bottom tend to be coarse, earthy and fibrous. The center leaves of the plant are the most tender and are richest in flavor. They bring the farmer the highest prices when he takes his tobacco to market.

The stripped leaves are strung evenly upon tobacco sticks as they arrive at the barn, and as each stick is loaded, it is placed across the poles inside the barn. The women help in this important task. Soon the interior is festooned with the leaves, each loaded stick carefully spaced so that its burden will receive its share of heat when the

In the Tobacco Barn

the newly picked leaves are "cured". The barns are generally constructed of logs snugly fitted and carefully chinked. "Bright" tobacco is cured by heat supplied by kilns wood-fueled from outside. This process requires several days, and the curing season is a busy period in the farmer's life.

fires are lighted. Care is taken not to overcrowd the barn. As it is filled the word is passed to pull no more tobacco for the day.

Now comes the curing. Thermometers are placed so that the heat within the barn can be measured and regulated. A slow fire is started in the kilns. As the flues warm up, the farmer watches the fire carefully because during this early phase the heat within the barn must not be more than twenty degrees above the average temperature outside.

For thirty to forty-eight hours the moderate heat is maintained, depending upon the appearance of the leaf inside. The idea is to bring the tobacco to a bright orange-yellow shade.

As the leaf reaches its proper color the temperature within the barn is slowly raised. The tobacco soon begins to curl and dry. The ventilators are opened so that the damp, sap-laden air will pass out, and the fires are built up to compensate for the loss of heat. Despite the high temperature sixteen to eighteen hours are required in normal weather for all the leaves to dry.

At the end of this period one more vital task lies ahead. The man who is tending the barn is

weary now. Day and night he has been feeding the fires and watching the cure. But like a runner at the end of a tiresome race, he must sprint at the finish.

The thick, fibrous stems are not yet entirely dry. Unless they, along with the much thinner membrane of the leaves, are completely cured, the leaf tissue will "scald" or become discolored from a back flow of the sap.

So up goes the fire again. The temperature must be held high until every molecule of dampness is drawn from every stem. Often this takes at least sixteen more hours of firing.

This is no time for the barn tender to go to sleep. He may be operating two or three barns at once. He may be so tired he hardly can keep his eyes open, but without this final spurt, all his work may be useless.

Now is the occasion for one of the all night barn parties for which the tobacco country is noted.

The family and guests assemble to help the barn tender and to celebrate the final curing. There is fried chicken, hoe cake and cool buttermilk. Sweet potatoes and apples are roasted in the embers beneath the kilns. Cider flows. Uncle

Joe has brought his banjo and the Walker boys have their fiddles ready. Stories are told; news exchanged.

Light from the glowing kilns shines now upon bright faces. Old hymns are sung. The barn man's drowsiness no longer bothers him. There are friends to help at the fires and share the long night hours. But he must watch the temperature.

Also he has another care. Some of the flues within the barn have become red hot. A faulty pipe, a crack in the kiln, a bit of falling tobacco may set afire the contents of the barn and bring his work to nothing. Carefully he lowers the heat to cool the pipes a bit—but not too much or he will cool the barn. The temperature must stay just as high as he can keep it—safely. Most of the tobacco now is as dry as tinder.

Someone shouts. On the southern horizon there is a glare in the sky. A distant neighbor's barn is burning. There is a groan of sympathy, and some nervous laughter. The barn tender looks at his flues again, and thinks about the time two years ago when one of his own barns flared up almost like a flash of gunpowder when a defective flue gave way.

The fiddlers are playing "Money Musk" and a

banjo player is strumming melodiously. The girls are laughing. Over the trees the harvest moon has risen like a giant pumpkin. . . .

As the merrymakers stroll home through the gray dawn light, the barn tender ducks into the superheated structure to test the stems again, to sniff the hot air. Sometimes he must wait until noon or later before he is satisfied that every leaf from tip to stem is tinder dry. When this happy time comes, he can permit his fires to go down.

Carefully he watches lest a spark find its way into his precious tobacco.

As the barn cools, the outside air flows in and the dry leaves begin to absorb some of the atmospheric moisture. The tobacco becomes soft and pliable again. The barn tender takes a last look to be sure his fire is out, and goes home for a badly needed rest.

Later the loaded sticks are taken down and the tobacco sorted for temporary storage and for sale.

The farmer may have produced a crop of fine quality, thanks to good land, good weather, good luck and hard work. He may have brought out the most beautiful color during his curing. But inevitably in every barn there is some good

tobacco and some better tobacco. He must be sure that all of his best center leaf tobacco is in one lot, all of his average leaf in another, and that none of the poor quality creeps into either lot.

Even the most competent farmers frequently have trouble sorting their lots properly and seek the advice of expert professional graders. Few of the farmers have much opportunity to learn the market and its constantly shifting demands. Often, too, in a hurry to finish a long, trying season, they are careless and permit more than one grade to creep into the same pile. This inevitably depresses the value.

Sorting, then, with the greatest possible care, he ties each lot up into little bundles or "hands" of from twelve to twenty-five leaves each, which he places in his storage barn, ready to be hauled to market.

The farmer can relax now. I found him one afternoon sitting on the sill of his last barn, a good-humored, sun-burned giant of a man. He chewed a fragrant leaf reflectively:

"Guess I've had good luck," said he. "The weather wasn't any worse than usual."

"What will the prices be?"

He did not look up.

"I make good tobacco. It's the boys who make the common stuff that have to worry so much about the prices."

He smoothed a beautiful yellow leaf between his hands, as a woman might fondle a bit of fine satin.

"Of course everybody has some mean tobacco. All of it just can't turn out right, but with three thousand pounds of this good leaf, I'm going to have some money to spend, and I'm going to be able to lay something by."

I offered him a cigarette.

"I guess the manufacturers have their troubles too," he said philosophically as he examined it. "They don't get a cigarette like this by accident any more than I make tobacco like this by accident." He waved his yellow leaf. "They don't have weather to bother them much but some years I bet they have the dickens of a time getting enough decent tobacco for their needs. I've known wet seasons when my leaf wasn't fit for bug juice and I could hardly give the stuff away. A man who'd put that leaf in cigarettes would have been a fool. But then again there have been years when I cleared twenty cents a

pound or more above all expenses and counting labor, too. But the manufacturers can't let their cigarettes have ups and downs. They've got to keep them up to standard every year. I've often wondered how they do it."

IV

THE AUCTION

THE sales at the opening of the markets in Virginia are extraordinarily exciting. In the tradition of three centuries of tobacco culture they more closely resemble English fairs of the Shakespearean period than any other New World gathering.

There is a market town within a day's wagon haul of nearly every farmer. Here, on the eve of the opening of the sales, the farmers meet the buyers, and both make carnival as well as business. Some of these market places are cities of considerable size; some are little more than cross roads villages, but when the first sale of the season begins on a day in early Autumn, all alike are gay.

The air is laden with suspense. Farmers, who have been arriving all during the night at the great warehouses, do not know what their leaf is going to bring.

Buyers, sent by the domestic and foreign manufacturers, brokers who buy on their own account, and representatives of foreign govern-

mental monopolies, are uncertain as to the quality and quantity to be offered, and the prices they will have to bid.

Warehousemen guess in vain at the probable volume they must handle.

Business anxieties, however, do not depress the actors in the drama. They have worked together before, and they are glad to see each other once again. Friendships are renewed, gossip exchanged. There is laughter in the busy warehouses—great airy buildings whose floor space sometimes is measured in acres. On the streets is music. Banners of welcome extend from corner to corner. The firemen's and policemen's band, mounted upon a tremendous beribboned truck, is playing "Stars and Stripes Forever." On a float loaded with pretty girls rides the Queen of the Tobacco Festival, smiling at the cheers which greet her.

Farmers still are pouring into town from every side, some in trucks, some with the back seats of their automobiles loaded with golden leaf, some in wagons drawn by mules, a few in ox carts that have been on the road for twenty hours.

They go at once to the warehouse of their

Tobacco Comes to Market.

Farmers haul their tobacco to a nearby auction warehouse. Here they unload the precious bundles of leaves and pile them neatly on "baskets" which are really shallow trays. Soon the floor will be covered with baskets of tobacco.

choice. They let nothing distract them until their tobacco is unloaded. Here the farmer divides his load according to the color and quality of his offering, among many of the wide flat, split oak baskets furnished by the warehouse. Often a farmer will enlist the help of the warehouseman, whose expert knowledge of market grades can be extremely valuable.

Sometimes one basket will contain only twenty pounds of tobacco, another several hundred. Quite frequently a small lot, because of a special demand or exceptionally good quality will sell for twice as much as a larger one. Each basket of tobacco, its bundles arranged in a rounded, symmetrical pile now is weighed and marked with a ticket bearing the weight and the owner's name. This data also is recorded at the scales in the warehouseman's book.

The basket loads of tobacco now are rolled on hand trucks to their allotted places on the broad floor. Hundreds of baskets are lined up in regular order until the floor is covered with long parallel rows. Between each line is a passageway wide enough for a man to walk.

All night long the rumble of the wagons is heard and men are at work unloading. The ware-

housemen and their clerks and helpers get no sleep at all. Here and there a weary farmer dozes near his pile of tobacco, waiting for morning. Others, their job done, are at the hotel playing seven-up or poker or trying in vain to sleep, their heads filled with hope and figures.

The day of the sale, the farmer rises shortly before dawn and goes down to the warehouse. Trucks and wagons still are unloading within the building, but as the first gray light of the big day filters in through the eastern windows, nearly everything is ready for the sale.

Women in gay gingham dresses have brought coffee and sandwiches. More than a hundred farmers now have assembled, although the sale will not begin until 9 o'clock. Some of these men are dapper, well-dressed youngsters whose deeply sunburned faces and calloused fingers give the only hint of their vocation. Others are big-boned men in overalls and wide, felt hats. Some are Negro farmers, whose ancestors, like those of their white neighbors, have raised tobacco for generations.

The rays of the sun are slanting down upon the busy floor. The crowd has increased. Here and there a buyer is wandering, looking over

A Section of a Huge Auction Warehouse

in Lexington, Kentucky. On its 210,000 square feet of floor space there has been as much as 1,916,000 pounds of tobacco at one time. This warehouse is one of the largest of its kind in the world. Its area is more than eight and a half times as large as the main concourse of New York City's Grand Central Terminal.

the ready piles of leaf.

This buyer, too, is anxious. He has his orders from the manufacturer for whom he purchases tobacco. The requirements are listed in his notebook. He knows his quota for the day and season. His rivals over there in the other lane also have their orders and their quotas. Soon they will be bidding against each other furiously. Not only competing manufacturers are represented on the floor, but brokers who buy leaf for British firms, and for foreign governments. There are dealers, also, who buy for their own account, speculating upon momentary shifts in the demand—purchasing lots one day for resale on the next, or later. These independent traders often keep the market lively, and their operations sometimes mean a higher average price.

As the hour for the opening sale approaches, the air within the warehouse is electric. Weary farmers now are wide awake. They buttonhole the warehouseman, a wise and cheerful man.

"There'll be a big break, Joe?" the farmer asks.

"At least two hundred thousand pounds is on the floor," says he, and shakes hands with his questioner, asking about his wife and family.

"The price?"

The warehouseman grins and shakes his head.

"We've got a good set of buyers—that's all I can say right now. We ought to get a better average than last year. See?" He waves his hand. "The quality is better. Some of you Roanoke river boys are learning how to make tobacco after all these years."

The farmer laughs.

"Who is the auctioneer?"

"Ned Jones."

"That's good. He'll goose 'em up. He always does. He sings a pretty song, all right."

There is a bustle at the door. More buyers have arrived. And there, towering half a head above the group is Jones, the auctioneer. Men wave to him.

"How's your voice today, Ned?"

"Fair to middlin'."

The warehouse bell is ringing now. The time has come!

A happy milling throng surrounds the auctioneer and the corps of buyers as they proceed to the head of the line—the point where the first leaf to arrive has been placed on the sales floor. The warehouseman, in the center of the group,

"Sold!" Tobacco Auctions are Exciting.

The auctioneer chants his strange song of bids at the rate of more than 400 words per minute. Alert buyers bid by signals as the sale proceeds. They can detect in a moment tobacco qualities hidden from the average eye.

is jubilantly waving over his head a "hand" of tobacco which he has picked up from a basket along the way.

"Wheeeee!" someone gives a yell. The bell now is clanging furiously outside.

The auctioneer has taken his station. The buyers struggle into place beside the first basketful of tobacco. They stoop and look at it carefully, reach down and finger it, pull bundles out from the bottom and, after a glance, toss them back on the little pile.

The warehouseman, too, is examining the basket of tobacco, for it is his job, from his expert knowledge of the market grades, to set the starting price of each basket.

"Twenty-five," shouts the warehouseman.

Pow! — the auctioneer's big hands come together with a noise like a gun shot. He points to the first lot. They're off!

The man's voice begins in low register, taking the price from the warehouseman's cue.

"Twenty-five, five, five, five, six." He pauses for a fraction of a second, his voice rises. "Twenty-six, seven, seven, eight, twenty-eight, eight." He chants at more than four hundred words to the minute, his voice flowing in waves, now at a low

pitch, now higher, "Twenty-nine, I hear, nine, nine, nine, thirty, I see, thirty, thirty-one, one."

One of the buyers leans over and feels another handful of the leaf.

"One, one, thirty-two, two."

All this in but a tiny fraction of a minute.

"Thirty-two it is—two, two, two. Sold." Pow! His hands have come together again, and he has moved on to the next basket.

Thirty-two cents a pound is the price upon his first lot. A clerk has picked up the ticket. A nod from the auctioneer has designated the successful bidder. The name of the company with the bid, is written on the slip.

"Twenty-one, twenty-one, one, one, one, one, two, twenty-two . . ." The auctioneer's song is now staccato.

Without a pause he has picked his opening price from the warehouseman and started to sell the second lot. The bid is up to twenty-six by the time he has gone four steps. The sale is completed. On he moves, barely pausing at the basket, his eyes busy, his voice in a high, rolling, sonorous chant.

None of the buyers say anything. They bid by signals. One man rubs his chin, another pulls

an ear, others use various motions of the fingers or the eyes, a mysterious language of the auction floor that has developed during the centuries. Bids were offered in the same way many years ago when tobacco was sold only by the hogshead, but the signals of today are less conspicuous because the auctioneer, instead of standing on a high block with a hammer in his hand, is down on the floor with the buyers, within arm's length. His sharp eyes are as busy as his musical voice and his heavy hand.

Pow!

The sale has progressed thirty yards down the line and more than a thousand pounds of tobacco of every grade and price has changed hands in less than five minutes.

The warehouseman is leading the auctioneer and the little group of buyers. It is his job to classify the basket mentally into one of the hundreds of different grades he must be familiar with, to estimate its probable value, and to set the opening bid for the auctioneer to take up in his strange chant. The warehouseman keeps his eyes each time not only upon the buyers, but upon the owner of the leaf, making certain that this man, his customer, understands what is hap-

pening. No one else pays any attention to the succession of farmers who, from a point as close as they can get, watch hopefully for the price that their particular lots of tobacco bring.

Generally, the farmer is satisfied. Sometimes he is not. In this event, he does not have to accept the bid offered. If he so chooses he can "tuck his ticket"—and refuse the bid upon a part or upon all of his offering. The tobacco then may be held over for the next day's sale, or hauled away to another warehouse or another market.

"Fifty, fifty-one, one, one, two, fifty-two—fifty-two, two, two, two, three, three—fifty-four . . ."

There is a shout that reminds old timers of the Rebel yell. Over near the middle of the second line, the auctioneer has reached a special basket on which a group of brokers are bidding.

Hundreds of people who now swarm around in the warehouse begin to cluster around the sale. More shouts. A girl laughs. A strong arm helps her up on a box where she can see the proceedings over the heads of the crowd. "Whee! That's some of Eddie Neal's leaf!"

"Fifty-seven, seven, seven..." The auctioneer's head is bobbing and he is pronouncing the word

with a high-pitched humming sound. He is as excited as the crowd. He loves to reach a lot like that.

"Eight, eight, eight, fifty-eight . . ."

The crowd is cheering him on. Eddie Neal is the center of a group that is dancing about in great excitement. Neal, a gawky twenty-year-old youngster in a sweatstained blue shirt, is trying to keep a straight face. He knew that basket would come high, but—well it's going higher than he thought it would. . . .

"Sixty, sixty." Pow!

People will talk about Eddie Neal's tobacco for the remainder of the day, possibly for the rest of the season. Older farmers will recall World War days when almost anybody could get sixty cents a pound, and quite a few got a dollar or more. Those were the days.

On sweeps the sale, up and down the rows, up and down an amazing range of prices. Here is another lot of almost perfect orange leaf sold for fifty-two cents. Just beyond, four hundred pounds of rugged discolored lugs brings only three. It is useless for smoking—good only for "bug juice," an insecticide.

Laymen who follow the sale and examine the

tickets are completely bewildered by the variance in prices. One basket-load looks exactly like its next door neighbor and was produced by the same man, yet one is marked 20 and the other 34. They do not notice that the low-priced lot is made up of "primings"—the first leaves harvested, the ones closest to the ground. These are larger, thicker, coarser than those along the center of the stalk. A novice's fingers cannot detect the difference in the weight and texture; his eyes, are not even able to observe vital variations in color.

A veteran tobacco expert, however, can trace the whole story of a sale by passing along behind the auctioneer. He can spot the producer of almost any lot by just a glance at a pile of leaf. The tickets also yield strange information. The Japanese government is buying heavily today. How does he know this? He is acquainted with the initials of the broker who makes purchases for Japan. The British are in the market, too. They like color, color, color. A big "A" appears on the ticket of many high priced lots—the mark of The American Tobacco Company. Often near the basket lies an empty Lucky Strike package, for Luckies seem to be a favorite with most

of these tobacco men.

Farmers now are receiving their checks and settling their accounts at the window of the main office. Out on the floor the tobacco is being moved out to the buyers' prizeries—the packing houses where it is inspected and placed in hogsheads for shipment to the re-drying plants. Some of the leaf is on its way before the sale ends. The hogsheads hold from 800 to 1,000 pounds each.

Over by the door, a grizzled farmer chats with Ned Jones, the auctioneer. Theirs is the quaint language of the Virginia hinterland with words that date from the first King James.

"How yo' folks, Joe?" asks the auctioneer.

"Pretty peart, thank you," replies the farmer. "When y'all goin' to git down our way ag'in, Ned?"

"Christmas time, maybe. 'At was good leaf you brought in today, old timer. Made my soul fat to see you still makin' such fine tobacco. And 'at boy o' yourn's no slouch either. He's gittin' right smart gumption."

During the sale the auctioneer sometimes chanted 460 words per minute, but here, gossiping with a former neighbor, he actually drawls.

The auctioneer remembers virtually every

one of the hundreds of transactions of the day in spite of the speed with which he passed along the lines. Since he has served at sales in every part of the Bright tobacco region from Georgia to Virginia, he can give the farmers invaluable information as to market trends, changes in methods of curing, and as to the grades the various companies are buying.

The farmer asks him:

"What about those barns I heard of that's usin' oil heaters 'stead o' wood fires?"

"They're tryin' 'em out in some places where they're runnin' short o' firewood," the auctioneer replies. "You see with wood gittin' scarce as hen's teeth on some farms now, they figger oil heat can do the trick. I hear the fuel costs about $8 to cure a barn. It runs into money but it may save a mess o' trouble. You see those barns have thermostats in 'em."

"They have what?"

"Thermostats. Thermometers that cut the heat off when it rises right, and turn it on ag'in if the barn begins to cool. Just means no more sittin' up nights."

"I'll be dogged!"

The auctioneer waves a goodbye.

With money in their pockets the farmers whose tobacco has been marketed go out into the town, their weariness for a while forgotten. For many of them the cash represents the first returns from the agricultural season. There are debts to pay and numerous purchases to be made for the Autumn and Winter. Main Street looks like the midway of a Fair. On every block are friends. The motion picture theatre is crowded. A baseball game to decide the championship of four counties is an event of the afternoon, and it will be followed by a pageant at which the new Tobacco Queen will be crowned. After this will come the Board of Trade banquet and a grand ball at the school auditorium.

A visitor to these purely social festivities in the tobacco country finds the same people whom he met in the warehouse during the early sale, but he has some difficulty recognizing them.

Gone are the work clothes. Faces no longer are lined by suspense and business worries. Everyone knows everybody else, and the gayety is that of a family party. Frequently the ball, after the grand march, breaks up into two dances, one for the elders, who prefer the square dances of olden times, and one for the younger people,

who like the modern steps.

The manner of these people who have been living in the same country and producing the same difficult crop for twelve generations is a delight to watch. While there is no obvious formality or stiffness, deeply rooted customs govern their behavior. Never is there the horseplay which is thought to be common at rural gatherings. All have the dignity of men and women long accustomed to the most graceful social relationships. There is no observable borderline between those who are well-to-do and those who are poor. At one time or another among the hazards of Southern agriculture, all have encountered grim poverty, and many, now with small farms, have been rich.

Some observers doubt that there ever has been an extremely wealthy "tobacco aristocracy" in the South in spite of the romantic legends of days before the War of Secession. Owners of large plantations in the past undoubtedly cultivated tobacco, yet the nature of the crop made it most difficult, if not impossible, to handle it on an extensive scale with unskilled, or slave labor.

Great risks and a dearth of expert tenants have

tended to keep down the average acreage per farmer. Experience has taught them that a few acres of superior tobacco yield more revenue than a large field of poor leaf. One patch with 4,000 pounds of 40-cent tobacco is worth forty acres and 40,000 pounds of the lowest grade product. The better informed farmers are concentrating upon a quality product and are now "making" better tobacco than ever before.

V

EARLY PROCESSES

In tracing the romantic, many-sided story of tobacco, one leaves the Old Belt country with regret, but the glamour which surrounds this amazing American crop follows it throughout the entire route between the tiny seed and the finished product, the cigarette.

Trailing the hogsheads of freshly cured, recently sold tobacco out of the prizeries—the packing houses where it is prepared for shipment—we find it a few hours later in the plant of The American Tobacco Company. It passes from the pastoral atmosphere of the seventeenth century into the modern bustle and precision of the twentieth in less than a day.

Yet for all the puffing of locomotives, the rumble of giant motor trucks, and the whirr of machinery, one still feels the magic of tobacco. The aromatic fragrance lingers here just as it does in barn and sales warehouse.

The golden leaf is handled gently enough by the people who "make" it in the fields, but the processors, for all their machines, four-storied

buildings, white paint and uniformed operatives, handle it with even greater care. They have not only the same anxieties that furrow the brow of the producers, but they show in addition the painstaking craftsmanship of the individual tobacconists of a bygone era.

As that farmer remarked to me when I met him at the door of his barn, the manufacture of a tasty, rich, non-irritating cigarette, that always is the same year after year regardless of crop failures, variations in the quality of annual offerings and all the other hazards of agriculture, is an industrial miracle. None of the old tobacconists who made their blends by hand ever were able to obtain the same remarkable results. The individual craftsman worked with but a few pounds of leaf at a time, while the modern manufacturer handles millons, but despite all of the complexities of mass production, the latter, by close attention to a thousand infinite details, obtains results that are far superior.

Industry did not conquer these details all at once. Manufacturers are still learning new things about tobacco. However, they have adapted successfully to modern factory conditions the fine techniques of the best private

blenders, and for the past seventy years, steadily, through greater resources and broader research, they have improved upon them.

The first treatment given the newly arrived shipment of tobacco is known as re-drying. The word is only half descriptive of the process, for it consists not only of drying the leaf again, but re-moistening it as well. The idea is to put a carefully measured amount of moisture in the packed tobacco so that it can be aged without danger of spoiling. As the leaf comes from the market, it has such varying amounts of water in the cells that all of it would spoil if it were not treated.

As soon as the great hogsheads are unloaded, therefore, they are rolled into a re-drying unit of the factory. This big, fire-proof, ultra-modern building looks like a complete plant in itself. It is buzzing with the activity of hundreds of people.

The big hogsheads are unpacked on the main floor and the tobacco, still tied in the little bundles, is sent upstairs in the form of cylindrical cakes. Here a corps of women workers take the cakes apart, bundle by bundle, and string the tobacco upon exactly the same kind of sticks used in the curing barns back on the farm.

The Tobacco Arrives at the Redrying Plant

packed in large hogsheads. Here the hogsheads are stripped off, so that the tobacco can be made ready for storage and aging. It will be at least two years before this tobacco is finally rolled into Lucky Strike cigarettes, and each day of its life during that period contributes to the flavor of the cigarette.

The loaded sticks are placed upon conveyors which haul them slowly into a long, steam-heated box—the re-drying machine. In the near end of this machine, the temperature is up to approximately 200 degrees and here every drop of atmospheric moisture is taken out of the leaf. The tobacco is as dry as tinder before it moves seventy feet through the hot chamber. Thereupon it passes along into another compartment of the machine known as a cooling chamber, where fresh air passes through the tobacco and cools it. From here, humidifiers spray a mixture of steam around the tobacco, so that a carefully measured amount of moisture is added.

As the sticks, strung with the bundles of tobacco, come out of the machine, they look as they did when they went in, but now there is no variation at all in the moisture-content. In this proper condition, it will keep almost indefinitely.

A crew of men receives the loaded sticks as they leave the re-drying machine—packers who replace the bundles in hogsheads like those in which the shipment was received from the prizeries.

The coopers who reassemble the hogsheads

when the tobacco is unpacked and the men who replace in them their burden of properly moistened leaf, work with a rhythm that is delightful to watch. The coopers beat a tune upon the staves as they close the barrels—a tune as measured as the rattle of a military drum. Factory regulations do not require the men to be musical in their work, but the balanced rhythm enables them to make faster progress and, at the same time, to satisfy the longing of every workman for smooth, orderly accomplishment.

Each loaded hogshead contains between 750 and 1,000 pounds of tobacco as the "bull gang," a team of strong-backed young men, roll them over to the elevators. Apparently, the size of these great containers was long ago accurately gauged to the ability of a strong man to roll them from place to place. There was a time, too, when farmers used similar hogsheads to haul their tobacco to market. The containers were reinforced by extra hoops to stand the wear and tear of the road, and an axle was passed through the center line and mounted on a frame. An ox then was hitched to the hogshead and it was rolled on to its destination. There are people still living who remember when farmers brought their tobacco

It Must Be Re-Dried

and then evenly re-moistened before it is aged. The leaves are carried on huge conveyors through the re-drying, cooling and re-moistening chambers of these huge tunnels which are as long as a city block. The tobacco emerges from this process containing an accurately measured amount of moisture—the precise degree necessary for preservation and flavor enhancement during the aging process.

down to the city in these traveling hogsheads.

The tobacco is moved from the re-drying plant to the modern storage sheds which occupy many, many acres of ground nearby. The sheds are rain-proof, yet they are open to the air on all sides.

Here the hogsheads of leaf which we saw auctioned two days before may rest for as long as three years.

Three years! Millions of pounds of tobacco in idleness, millions of dollars in capital tied up, because all of the ingenuity of modern industry has been unable to find a substitute for the all important treatment that time gives tobacco!

Something that still is very mysterious, yet of vital importance, happens to the tobacco during those long months in the storage sheds. A delicate fermentation takes place in the Spring and again in the Fall as the air flows in around the porous hogsheads. The leaf, in tobacco vernacular "sweats." Before it goes into Lucky Strike cigarettes, it must have at least two "sweats," and plenty of rest. Like vintage wine, it is worth all the time that is given it.

There is a great deal of tobacco in these sheds. As the new purchases are trucked into

Where Tobacco "Sleeps"

This is one of several groups of Lucky Strike storage warehouses. Under the roofs of this group alone millions of dollars worth of tobacco leaves are laid away in hogsheads, to undergo the mellowing which only time can produce. It takes three years for a Lucky to be born.

place, other hogsheads, which contain properly aged leaf, are rolled on to the next step in the chain of production.

This is the stemming process. The leaves have heavy fibrous stems which must be removed before the tobacco goes to the main unit of the cigarette plant.

On its way to the stemming machines, Lucky Strike leaf undergoes its first blending, although at this stage the Bright, the Burley and the Maryland are all blended individually and not mixed together. Assembled here are hogsheads of mature tobacco representing every section of the growing area. If Bright tobacco is being stemmed, the so-called Old Belt of Virginia and North Carolina, the Middle Belt of North Carolina, and eastern North Carolina, South Carolina and Georgia, are all represented. A bit from each hogshead is inspected and placed simultaneously on the conveyor by a group of women, and so the produce of five states is mingled thoroughly. The tobacco is the yield of several growing seasons also. Some is two years old, some considerably older, but all of it is of the same high grade and light texture. The mixture on the conveyor, therefore, runs to a standard that

Leaves of Turkish Tobacco

are smaller than domestic leaves. Turkish tobacco is imported mainly from Macedonia, Smyrna and Samsoun. Strangely, nearly half the "Turkish" tobacco is grown in Greece.

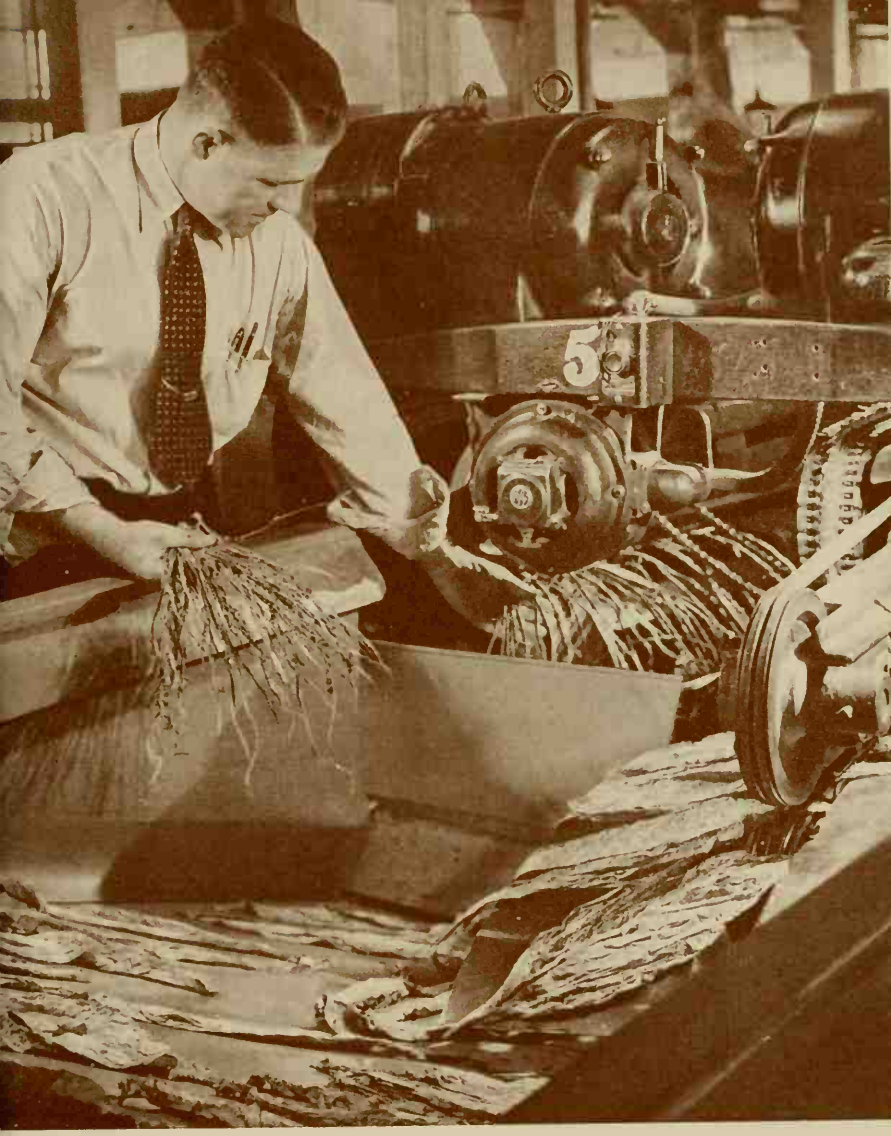
The Turkish Arrives

in closely packed bales. The arrival of a shipment of Turkish is the signal for a parade of bale-laden porters past the government inspector who checks them into the bonded warehouse.

is most important in maintaining, day after day and year after year, a uniform quality. Burley tobacco, which comes mainly from Kentucky and Tennessee, and Maryland tobacco, from north of the Potomac, are stemmed and subjected to their first blending in the same fashion.

The tobacco is first put in condition for stemming and then the machines untie the bundles, smooth out the leaves and strip away the tough stems. A crew of nimble-fingered women inspect the leaves again as they enter the machine, and take out any that are not of the best quality. As they pass through to the other side and the stems are removed, another crew watches and removes any leaves that are not thoroughly stripped by the apparatus. A ceaseless watch for stems continues throughout subsequent processes, for it is most difficult to remove from tobacco, even by hand, all of the fibrous parts of the big leaves.

Another machine now takes the processed leaves, a great metal container about 25 feet in diameter with a dome that extends up through the ceiling to the roof. This is called "the cyclone." A glance within explains its name, for as the tobacco flows into it, a mighty blast of air throws the leaf high up toward the dome and,



The Stemming Machines

do their work in three quick steps. First, they automatically untie the bundle of leaves—secondly, they strip the leaf up from the end of the stem—then they strip the stem out of the remainder of the leaf. Stems are sold to be made into a tobacco by-product.

like a whirlwind, blows out all the dust. At the top of the cyclone is a broad valve through which the dust escapes like smoke.

Cleaned, and thoroughly mixed, the tobacco falls down to the base of the machine, and proceeds on its way, ready for conversion into cigarettes.

The stemmeries which feed the Lucky Strike factories are very different from most plants of this kind because the air is conditioned. Old-fashioned stemming plants are dusty, uncomfortable places, but here all of the tobacco is kept in normal condition while it is being worked, and the dust is carried off. Conditioning the air also prevents the loss of quantities of tobacco which on hot, dry days would crumble away.

VI

"IT'S TOASTED"

When the tobacco reaches the main plant from the stemmery, another blending takes place immediately. Here for the first time the Bright, flue-cured leaf is blended with the Turkish, and the air-cured Burley meets the darker Maryland.

Burley, Bright, Turkish and Maryland—all four are representative of three or more seasons, of hundreds of different growing areas, of thousands of different farms. It is only by making the most extensive cross section of entire regions and crops that an adequate standard can be maintained day after day and year after year.

Hundreds of years of smoking, however, have shown that no matter how carefully tobacco is grown and cured, all of it has irritant properties. Tobacconists for many generations have tried various methods of removing the harshness. They have besought the farmers to make more careful selection of types. They have tried many different methods of curing. Thousands of different blends, hundreds of different processes, have figured in their experiments.

The American Tobacco Company has been a leader in this research. It has developed the now famous "Toasting Process" which, to a great degree, is responsible for the smoothness and gentleness of Lucky Strike cigarettes. Other processors have tried the heat treatment of tobacco but none has attained the success that has made Luckies such a favorite with the modern smoker.

"Toasting" is a complicated process which involves a number of different steps in manufacture, and to describe it in detail would require more technical knowledge than an ordinary newspaper man is blessed with. Three steps in the process impressed me particularly — the higher heat treatment given the tobacco, the "bulking", and the use of the ultraviolet ray. The toasting process seemed to me to be a modern scientific process founded on the fundamental principles of tobacco lore. I will give you a layman's slant on it.

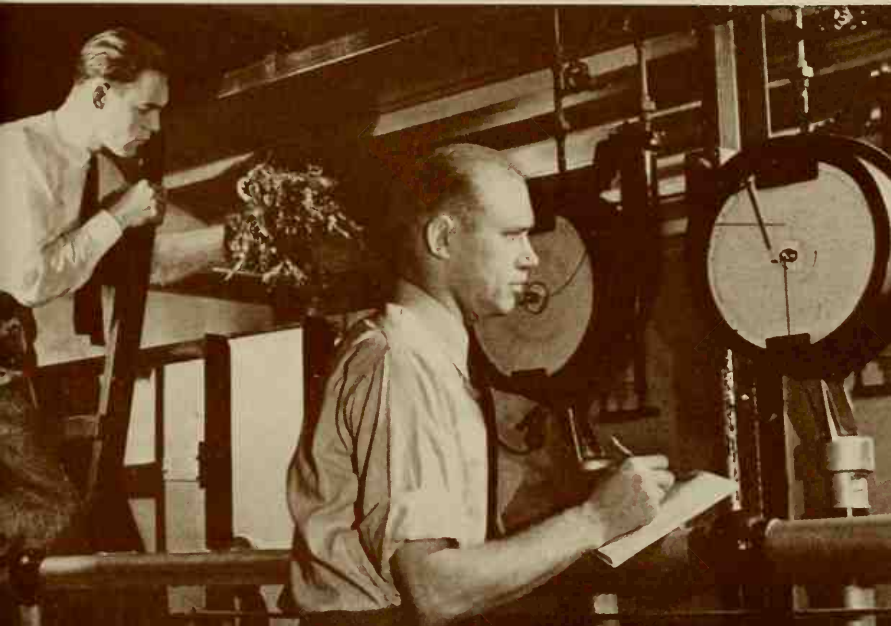
The tobacco passes along conveyors to a series of large chambers, empty save for a long battery of heaters. Spread evenly over a moving belt, the leaves travel slowly through heat, higher by many degrees than that which is usual in ciga-

The Toasting Process

involves the use of higher-temperature flameless heat. Through all the various stages of this process the tobacco remains rich in texture and delightfully fragrant.

Throughout the Process

there is precise control of temperature and humidity. Heat and moisture are continuously recorded by precision instruments, and the slightest variation is promptly adjusted.



rette manufacture. At intervals are dials watched by alert young men who peer into the hot depths of the machines, turn cranks and, now and then, open little doors to look at the leaf that is passing through.

The heat is scientifically controlled by delicate instruments under the watchful eye of experienced supervisors so that the flavor of the leaf will not be impaired. An accurate moisture control is maintained over the tobacco during this entire process. The carefully supervised treatment distills from the leaf irritant oils which are present in all kinds of tobacco. Exhaust fans circulate the air and, in turn, are connected with flues which conduct these irritating substances to condensers located outside the building, where they are processed and later sold to the chemical industries.

I asked the foreman who showed me the toasting process if there were any secret to it.

"I suppose there are more secrets in the heat treatment," he replied, "than in any of the other things we do in producing our cigarette, but it would take some of our research men about a year to explain them all. You see we have a method all our own. Our toasting process is re-

lated closely to our entire chain of production—to the selection, the blending—everything. It is, naturally, a closely guarded process. It is the result of years spent in research to develop a light smoke, a cigarette that will be gentle on the throat."

The foreman examined a chart that was being made by an inked needle on a card, and turned a dial gently.

"You see," he continued, "tobacco is not an ordinary raw material like iron or sand or pulpwood. It is not exactly temperamental, I guess, but you can't dump it into a hopper and run it through and have it turn out right. You've got to handle it carefully. You can't hurry it or take any short cuts. You can't forget it, neglect it, for a second. In one sense tobacco is like a high strung thoroughbred colt. Given complete and careful attention it will turn into a splendid finished product you can be proud to own, but if any defect is permitted to develop during this tedious process, it is ruined. Maybe that is why men love tobacco so; because like a thoroughbred, it is troublesome, yet it always repays every ounce of effort. We think our Lucky Strike blend is worth every bit of effort we put into it."

The enthusiasm of this man and of the others I met in the factory was unique. All of them seemed to be as relaxed as children engaged in a fascinating, familiar game. Over each machine and in every office and storage room in the plant was a placard with the inscription—"Quality of Product is Essential to Continuing Success." All the workers were under discipline, but it seemed to be the self-imposed discipline of community life rather than the driving grind of machine-age production. There was none of the strain, the tension, that is noticeable in so many modern factories.

The plant manager seemed to know most of the 1,500 workers in the factory by name. The individuals at the machines and conveyors, at the bins and mixers, at the dials and the testing desks all were the same, friendly kind of people I had met in the rural tobacco markets a few days before. They had the same kind of smile and handclasp. They enjoyed the same stories. They glowed with the same fervent energy. They were tobacco people of the old school.

As the leaf comes out of the heating and re-moistening chambers, it again is blended carefully and here the four types—Burley, Mary-

land, Bright and Turkish—are for the first time mixed into one mass of fragrant leaf. This mixing takes place in giant copper drums which take in several hundred pounds at a time as it comes from the conveyors. It would be impossible for the best trained human hands to give the leaf as thorough a mingling as do these brightly polished containers.

At these drums I noticed chemists at work taking samples here and there for laboratory test. They measure the moisture to be sure that the leaf enters the machine in exactly the proper condition. They check the quality of the entire lot so that if the slightest error has been made in the processing thus far, the tobacco may be discarded and the trouble corrected. All through the factory these technicians are at work. Upon their watchfulness, no less than upon the competence of the engineers and mechanics who tend the thousands of gauges and check the charts, does the quality of the finished product depend.

After the tobacco comes out of the polished mixing drums, it is "bulked"—piled together—in a large air-conditioned room. The great mass of leaf is left in this chamber for twenty-four

hours or more.

This "bulking" is a mystery of the tobacco business. No layman can explain exactly why it is vitally necessary to dam up the flow of leaf through the factory at this stage. The practice is costly and it is troublesome. Yet experience has shown that unless it is done the cigarette is not as good as it should be.

A subtle change that affects the entire blend takes place in the bulking room. The tobacco does not ferment as it did during its years in the storage warehouses. However, something happens to it—something that all the ingenuity of thousands of chemists has not been able to hasten. The essential oils in the product get together. Millions of leaves start to exchange and share with each other the fragrance that they brought with them from the fields. No cargo of spices that ever came from the Indies is as richly aromatic as this bulking chamber. Magic seems to have touched it.

While tons of tobacco are flowing into one end of this room, a like quantity that has remained there for the required time is being withdrawn. This properly conditioned leaf proceeds then to the shredding machines, whose

sharp knives cut the tobacco into slender ribbons.

Why is it not cut before so it might be more readily handled? I don't know, but I was told that it must be shredded at exactly the proper time—no sooner, no later. At this stage, too, the moisture-content is reduced a bit.

It moves on next to strange machines that I have seen in no other tobacco factory. These are copper drums larger than the mixers, the interiors of which are equipped with batteries of arc lamps whose brilliant glow may be viewed only through dark glass.

This is the ultraviolet ray machine.

The men working here wear helmets as did medieval warriors. My guide gave me a helmet and for a moment I stared into the brilliant depths of the container. The tobacco was being turned gently so that the ultraviolet light touched every shredded particle.

"Artificial sunshine" said he.

"Why?"

"It tones up the tobacco," he replied. "You know sunshine mellows, and these machines really expose the tobacco to concentrated sunshine."

The Ultra Violet Ray,

with which the tobacco is treated in another stage of the toasting process, cannot be viewed with the naked eye. The men whose responsibility it is to supervise this operation must wear masks to protect their eyes against the powerful rays.

Out of the ultraviolet machine with every particle irradiated, the tobacco is purified and thus made ready for its final rest before manufacture into cigarettes. It is placed in boxes called "Saratogas" and moved to an air-conditioned room where it remains approximately eight days.

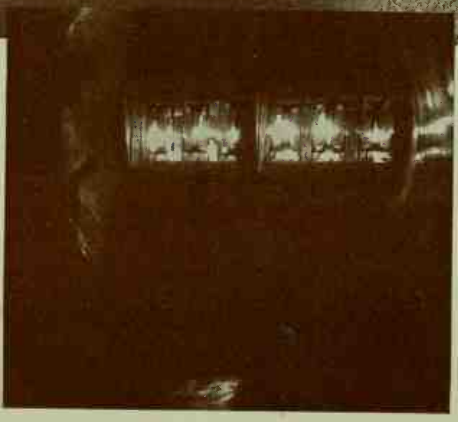
Here the fragrant oils of the tobacco further merge and the carefully controlled air takes off surplus moisture so that all of the tobacco reaches exactly the same condition.

"Eight Days!"

"Yes," said my guide ruefully, "eight days. As I told you before, you cannot hurry tobacco. Father Time is a firm taskmaster in this business. He has his finger on it from the time it leaves the seed bed and we cannot move a peg at any stage until he says the word. Time and tobacco laugh at machine-age haste."

This is Father Time's last laugh, however. From the time the tobacco leaves the resting room—this final eight-day rest in a process that has included more than two years in storage before it even enters the factory—it is caught up in the whirl of high-speed production at its best.

The gigantic plant takes its precious ingredi-



Under the Rays,

which possess properties of sunshine, the tobacco is tossed about gently so that each shred can be evenly exposed to their beneficial influence. The photograph above shows the ultraviolet ray chamber, with the rays momentarily turned off, because, as shown in the photograph at the left, it is impossible to obtain a clear picture of the chamber and the tobacco in the face of such powerful light.

ent now as though impatient because it has had to wait so long, and hurries it for a final blending to a circular conveyor that looks like a merry-go-round. Samples from each Saratoga are shaken out and mixed with the contents of every other one. The tobacco then is placed in other movable bins called "trolleys," and away it goes to the cigarette-making machines.

Here it is now, speeding along, and it is as perfect a cigarette mixture as the ingenuity of the manufacturer has been able to devise. To lift a double handful from the moving tray and sniff it is a sensory delight. No longer is it a collection of the finest tobaccos—it is a single integrated product. By close examination you can see tiny strips of orange-colored Bright, golden shreds of Turkish, and the somewhat browner Burley and Maryland, but they are all together now—completely, perfectly merged.

VII

THE LABORATORY

As we turned to move on to the cigarette machines, I again became conscious of those omnipresent research men. One of them was standing by the conveyor filling a little jar with tobacco. He looked at his watch, made some marks upon the label of the jar with his fountain pen, and, placing it in his pocket, walked away.

"Let's follow him," said my guide. "I think you'll be interested and we'll come back to the cigarette machines afterwards."

The man walked from room to room through the plant, past great insulated doors, over two streets through overpasses along which conveyors loaded with leaf tobacco moved, and down to the main floor again. At several points he took samples. Finally, he disappeared through a door leading into a series of rooms set apart from the remainder of the factory.

"The laboratory," said my guide. "This is the pilot-house of the plant."

He opened a glass door and we went into one of the rooms. There were rows of high tables,

each loaded with apparatus—long tubes of metal and crystal, clamps, racks, retorts, mixers, ovens, refrigerators, flasks under which Bunsen burners played, and hundreds of jars containing samples.

In the sample jars were leaves of tobacco from curing barns, tobacco that had come out of the fields a week before, cores of tobacco bored out of hundreds of hogsheads with a ship's auger, leaf from many storage sheds. On another table were containers with packages of Lucky Strikes that had been purchased and shipped in from various sections of the United States.

At work in this forest of glassware were dozens of young research men—chemists, biologists and laboratory assistants. Some worked upon tobacco, some upon cigarettes, others upon paper, tinfoil, pasteboard. One man was operating a table-sized distilling apparatus. Next to him a chemist stood back and watched the reaction of two liquids in an oversized test-tube.

There were two divisions of the laboratory, one testing the physical and the other the chemical properties of various tobaccos and materials.

I was introduced to one of the chemists. His eyes lit up as he talked about his work.

In the Testing Laboratories

samples of leaf tobaccos are carefully analyzed. Cigarette smoke is studied and its elements isolated. Cigarette paper is subjected to searching chemical analyses. Samples of each day's production of cigarettes are tested for moisure content, weight, circumference, air-flow and firmness of ends. Scientists of The American Tobacco Company watch the tobacco from the day it leaves the field until after it arrives at the retail stores.

"You can take the best tobacco in the world, run it through the best plant in the world, and still not get the best results," he said. "We must watch the simplest physical characteristics of our cigarette just as carefully as we guard its chemical characteristics. The circumference of the cigarette, the density of packing, the moisture content—all must be inspected constantly."

He stopped at the table containing the packages that had been sent in from various cities throughout the country.

"These Luckies," he said, holding up a jar, "were purchased at a store in San Francisco. These others were bought in Denver, Colorado. They are in exactly the same condition they were in when purchased, for they were sent from there in a vacuum container. We find out here whether they were in proper condition at the time of sale."

He looked at a chart.

"This batch is up to standard," he said, pointing to the figures. "See, the moisture content is well above the minimum, and they stood up well under the test we make to avoid loose ends."

He showed me the apparatus with which this test was made. Like most of the other strange

machines in the laboratory division, it had been designed and made to order. A long metal can was loaded with a pack of cigarettes and rotated slowly end over end for sixty seconds. At each turn every cigarette plumped end-first against the bottom or top of the can. Subsequently the cigarettes were accurately weighed to determine whether they passed the test.

He showed me the technique by which they tested the cellophane and other wrappings to see how tightly they were sealed. The accuracy of the machines used in this laboratory is amazing. Some of the delicate scales are so precise that they can actually measure the amount of moisture in the wing of a bee. I found that the research men took nobody's word for anything.

"We spend most of our time, naturally, upon tobacco," said my new guide. "We examine samples of a crop for our buyers before they start to buy—test it for chemical content. Thereafter we continue to analyze it periodically throughout the marketing season. Our research laboratory has been of great help to our buyers in advising them about the chemical properties of the grades of tobacco in various sections."

I moved on to a table on which there was a

row of retorts. A chemist, elbows down on the table, had been running a chemical test upon some unprocessed tobacco.

My guide took a tube from its rack.

"This is a solution of sugar that he has obtained from his sample," he explained. "The sugar content of Bright tobacco is a good index to its quality."

Near another bottle-laden table a man was busy at a desk.

"He is working on the blending formula," I was told. "The blend is controlled in this little corner of the laboratory. Blending is much more than a physical process. To be accurate, it must be governed by chemical analysis."

And now I noticed a very queer thing indeed. At the end of the room was a little metal hood that resembled a miniature railroad station shed. Inside, shielded from drafts by the hood and fastened to little jets, four cigarettes were burning.

"Smoking machine," said the chemist. "Look around behind it."

A tube from each lighted cigarette led to a smoke-filled flask which contained about an ounce of liquid. At the top of each was a chain

of test tubes and these in turn were connected to an apparatus about three feet tall.

This machine of glass and metal was breathing like a man!

At regular intervals a column of water rose and fell in a glass pipe. Simultaneously one of the four cigarettes puffed exactly as though a man were smoking it.

"A mechanical lung?" I asked.

"I guess you might call it that."

"Who built it?"

"We did."

Fascinated, I soon learned some interesting facts about smoking cigarettes. The average puff, for instance, contains 35 cubic centimeters of smoke, and the smoke moves through the cigarette at the rate of 17 cubic centimeters per second. The normal time between puffs is 60 seconds. The first portion of each puff is normally stronger than the last. The average smoking life of a cigarette is a fraction more than ten minutes. All of these human phenomena and others were reproduced faithfully by the machine.

"But what makes it go?"

The chemist opened a little door at the base of the rack and pointed to an electric clock.

Never Ending Research

has always played a vitally important part in the making of Lucky Strikes. Here is an architect's drawing of a new laboratory for The American Tobacco Company at Richmond. It will give the Research Department even greater scope in its important work.

"These smoking tests are very important to us," he said, "because they show the chemical properties of the cigarette under actual smoking conditions."

The smoke in the flasks settled in the solution at the bottom. Every single product of combustion was trapped for later analysis.

I asked about cigarette paper.

"We've done a lot of research on cigarette paper," he said. "You see, the paper must be absolutely pure and as completely free from irritating qualities as the tobacco itself."

With another testing machine and a microscope he showed me that the paper contains tiny air passages that assure smooth, regular combustion.

I would be in the laboratory still had I waited for the chemist to show me all of his equipment. As it was, he had used up most of his luncheon hour talking to me. He had forgotten all about it, as had I.

"The company places great emphasis upon research," he continued. "Practical experience has taught us much about tobacco but research adds to our knowledge every day."

He reported that approximately one-fourth of

the time of the laboratory unit is spent upon the analysis of tobacco samples; another fourth in the control of the various products purchased for manufacture; and the remaining half upon general research in all fields of handling, blending and processing.

As I started out of the laboratory, the luncheon hour was coming to an end. I went upstairs to see the cigarette-making machines with a new perspective on the intricacies of cigarette manufacture.

VIII

THE CIGARETTE MACHINES

Tobacco is converted into cigarettes in four rooms of the Richmond factory at the incredible rate of 10,000,000 cigarettes per hour.

A cigarette-making machine is not much larger than an upright piano. Scores of them are lined up in orderly ranks along the floor. On the keyboard side is a uniformed young lady, the catcher, who busily takes the white tubes as they emerge and places them in a rack at about the position where her music sheets should be. She examines the cigarettes as they jump into the tray.

Attending the machine is a young man—the operator—whose duty it is to keep the complicated apparatus in running order. He sees that the trolley of tobacco unloads its contents properly, watches the roll of white paper that also is feeding the interior, and now and then raises a lid to peer down at the tobacco.

Inside the machine is quite a clattering, and you notice that the tobacco is being violently agitated by little paddle wheels. This throws out

Millions of Cigarettes

every hour flow through these manufacturing machines under the supervision of trained operators.

A Four-Foot Cigarette.

When in regular operation this continuous cigarette is automatically cut into 2¾ inch lengths.

fine bits of stem called "slivers" that do not belong in the mixture.

At the bottom of the interior you see the flat band of pure white paper passing. As it moves, a carefully regulated quantity of tobacco drops gently upon the band. A few inches further this band of paper begins to fold around the tobacco to make a cigarette.

A dozen or more things now are happening at once. A little printer is stamping the famous "Lucky Strike" circle at intervals upon the paper. One rim of the band is being touched with a casein paste, made from milk. It is being rolled, pasted together to form a cigarette more than a yard long. And finally, as the long cigarette hurries through, it is cut into lengths 70 millimeters or 2¾ inches long. This self-sharpening knife is adjusted so that it cuts the tube at right angles despite the rapidity with which the big cigarette is moving through.

Another young lady in uniform, the inspectress, wheels a tray along and periodically, like the Goddess of Justice, with a set of balances weighs a counted lot of cigarettes from the rapidly filling rack.

The tiniest variation in weight means that the

Alert Supervision

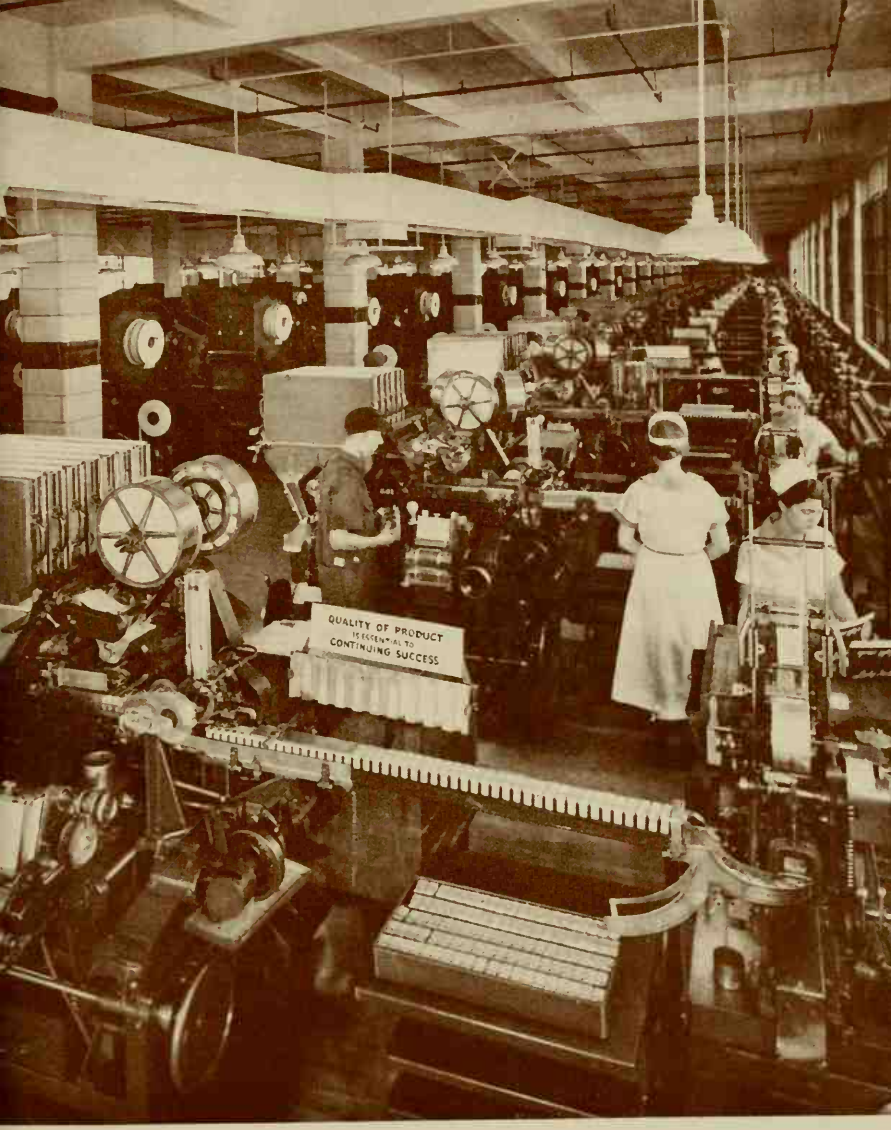
is noticeable all along the line. At each making machine frequent batches are weighed to assure uniformity and keen eyes examine the cigarettes as they go into the trays.

cigarette machine needs adjustment and if necessary it is stopped and overhauled at once. One of the most vital elements of a good cigarette is the amount of tobacco in each individual unit. A cigarette that is packed too tightly is as bad as one that is too loose. A rigid standard must be maintained here as well as in previous stages of manufacture. Quality cannot be sacrificed to speed.

While the cigarettes pour from the machine, the catcher piles them before her, eyes busy. Now and then she removes one or several, and throws them into the discard. A defect in the paper, a bit of stem that has escaped other watchful eyes, or something else may spoil a cigarette here or there. The remarkable thing is that so many thousands of them come from the machine in such perfect condition.

As the catcher's rack is filled, inspected, and then reinspected by the examiner, it is taken a few steps to another machine.

While less delicate than the cigarette-maker, this other one also performs many amazing functions at once. Cigarettes are fed into one end of it and tinfoil, paper and revenue stamps into the other, and an instant later, a complete



Twenty to a Package,

and these machines do the counting as well as the packaging. This machine even picks out any defective cigarette the operator may have missed. The package into which a faulty cigarette finds its way is automatically rejected.

pack of Luckies emerges.

One of the most unusual devices in this packing machine is a little automatic "detector." As the paper and foil are rolled to make a pack of twenty cigarettes, twenty metal fingers reach out and touch the ends of each. If there is a defect in any single cigarette, a light flashes and a little arm a second later, throws the whole pack into the discard.

The final function discharged by this almost human machine is to affix the Federal revenue stamp across the top of every perfect pack. These revenue stamps cost the manufacturer six cents each.

Yes, every twenty cigarettes bears a tax of six cents. It is one of the oldest excise taxes now extant, one of the first sales taxes levied in America. Uncle Sam collects more money on a pack of cigarettes than the combined profit of farmer, warehouseman, manufacturer, wholesaler and retailer.

A separate machine seals the packages in an overcoat of airtight, moisture-proof cellophane, a jacket that makes it possible to ship Luckies to the ends of the earth in perfect condition. Prior to the development of this transparent,

paper-like substance made from cotton and wood pulp, tobacconists depended largely upon tinfoil to keep the cigarettes in condition during sale. Tinfoil still is considered indispensable, but the new outer wrapper helps a great deal.

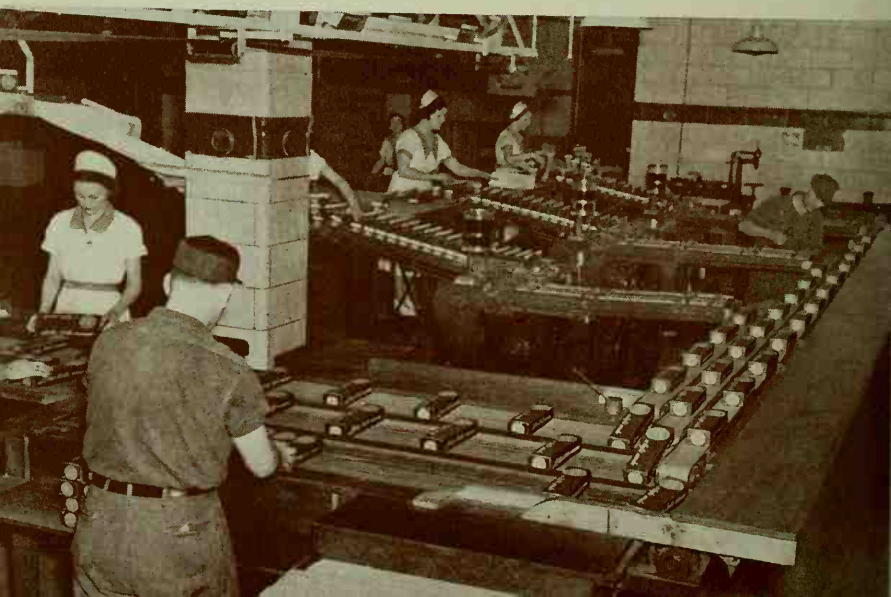
Incidentally the care with which tobacco manufacturers wrap their cigarettes gives employment to thousands of workers in other industries, some of them not far from The American Tobacco Company's main plants.

The cigarettes leave the factory almost immediately after they emerge from the last machine. Deft women pack them in their cartons and the cartons in turn are stowed away in boxes containing fifty cartons, or 10,000 cigarettes. By rail and truck, by ship and by air, they then are shipped to the four corners of America and to the ends of the earth.

On leaving the factory of The American Tobacco Company a visitor remembers the tobacco rather than the machinery. In the plant he has seen modern industry at its best. The workers are healthier, happier, less liable to accidents than the average man on the street. The cafeteria has the highest rating offered by the inspectors of the health department. The machine

Like an Express Highway
are the conveyors that carry the empty cartons to the filling tables.

Ten Packs to a Carton.
Here are the filled cartons. No busy city traffic moves more smoothly.



Out Into the World

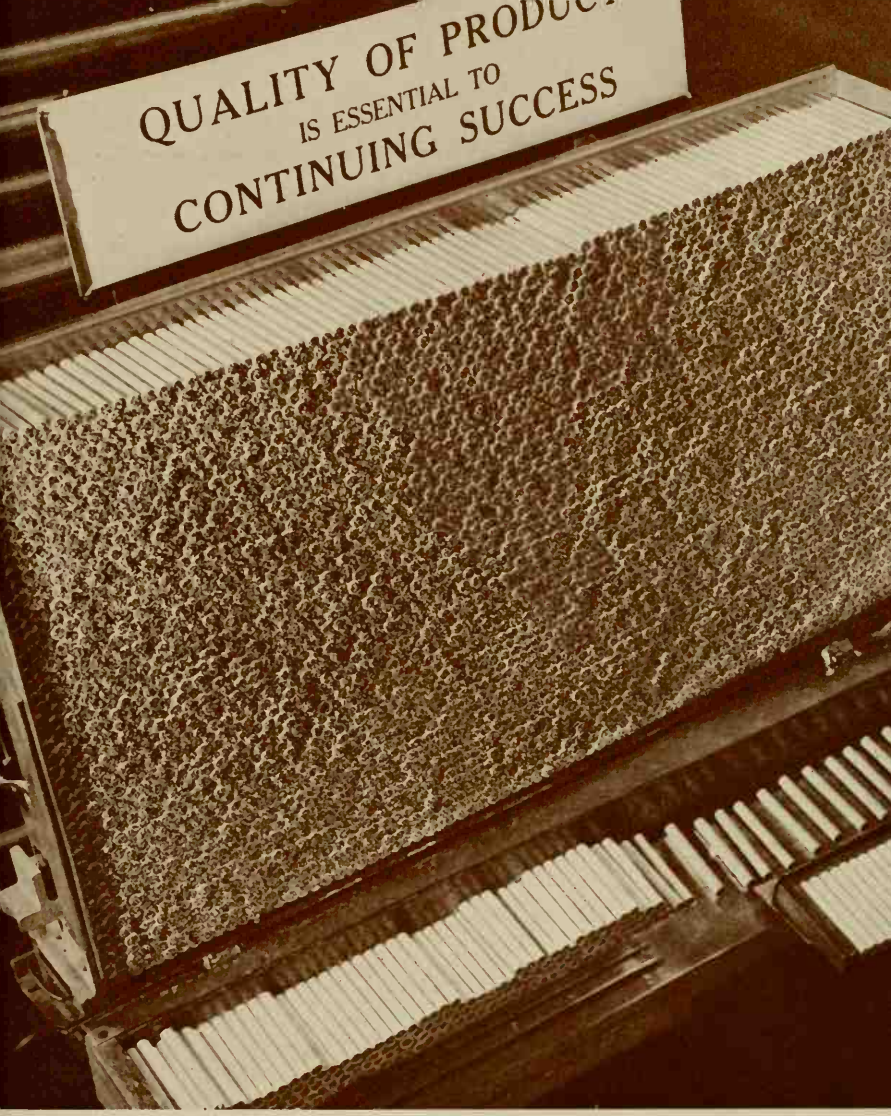
they move, like a mighty army—carload after carload. Each of these stout containers holds 10,000 cigarettes, and the Lucky Strike parade keeps moving out every hour of the working day—the finished product of fine tobaccos that began with a tiny seed.

shop is a magnificent place where new equipment is invented while old machinery is repaired. The offices, where men and women handle the complexities of management and distribution, are furiously busy, too. Yet everywhere within this hive of human bees, a visitor thinks and breathes tobacco.

Truly the story of Lucky Strike is an amazing blend of industry and romance, of the tradition of tobacco and the precision of modern science, of a magic product and of the men who handle it.

Soil and sunshine did their part to aid these artists with their golden leaves. Careful agriculture and selection helped. Science with its toasting ovens and its ultraviolet rays contributed much. Machinery and regulated air sped the process. But the ultimate secret of the product's gentle excellence lies in three centuries of human experience and skill.

John Rolfe's enthusiasm for tobacco made him forget the treasures of the Spanish Main and become a stout, home-loving planter. Other adventurers followed him to find excitement in this product of a new and dangerous land. And so tobacco played a major role in the develop-



Pride of Craftsmanship

seems to be a vital factor in the making of Lucky Strike cigarettes. Modern, almost unbelievably ingenious machines assure precision and uniformity, but each machine is controlled by watchful workers. An attitude of almost reverent attention and interest in their work is noticeable throughout the Lucky Strike factories. This seems to be characteristic of "tobacco people".

ment of our country.

With the smoke of a Lucky Strike curling upward, a man can dream of Pocahontas in her garden at Varina, of settlers farming with holstered pistols on the handles of their ploughs, of early craftsmen at work upon the first rude blends, of Nicot teaching the courtiers of Catherine de Medici the pleasures of the Indian plant —and then of countless men whose art and labor improved the leaf until it became the greatest solace of a troubled world.